

Work Order ID 76574

76574

~~U/R~~

Page 1

November-17-11 1:03:21 PM

Item ID: D350-748-101

Accept

N900040100

Setup Start *NS1*

Revision ID: ~~U/R~~

Stop *NS2*

Item Name: Crosstube Installation, High Fwd

Start Date: 17/11/2011 Start Qty: 1.00

1

Cust Item ID:

Required Date: 07/12/2011 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan: M.L.J

Date: 11/11/17 Tooling:

Date:

Run Start *NR1*

QC:

Date: SPC (Y/N):

Date:

Stop *NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

Draw Nbr

Revision Nbr

D350-748-141

F U/R OK 11-11-10

100

0.00

100

DOCUMENT CONTROL

DC

Memo

0.00

Document Control

Photocopy bluefile & type labels per PPPD350-748-101 CHG002

110

0.00

110

BENDING MACHINE - CROSSTUBES

CNC Bend 1

Memo

0.00

CNC Delta 100 Bender

Bend tube as per Dwg D350-748-141 using CNC bender program D350F and Folio FT

120

QC15- Crosstube Dimensional Check

0.00

120

QC

Memo

0.00

Quality Control

H:\FORMS\Inventory

Dart Aerospace Ltd

W/O: 76574		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector
		Stress relieve the for attached DCR ⇒ 650F for 2 hrs					

Part No: D350-748-101 PAR #: _____ Fault Category: X-tube NCR: Yes No QA Date: 12/05/30
 Resolution: _____ Disposition: Rework QA: N/C Closed Date: 12/5/31

NCR: 12/4/30		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
12/01/19	# 110	CP cuff's found to be oval. Range to 0.060" to 100" Rec Heat treat method	CP 12.04.19 Q51012	Rework as per attached email original min 2.189" max 2.234" after rework min 2.223" max 2.249"	CP 12.04.18	CP 12.04.29 Q51012	CP 12.04.19 Q51012	12/01/19
12.04.19	110	Tube is bent high + rework.	CP 12.04.19 Q51012	Acceptable	N/A	CP 12.04.29	CP 12.04.19 Q51012	12/04/19

NOTE: Date & initial all entries

Work Order ID 76574

76574

Page 2

November-17-11 1:03:21 PM

Item ID: D350-748-101

Accept

N900040100

Setup Start *NS1*

Revision ID: U/R

Stop *NS2*

Item Name: Crosstube Installation, High Fwd

Start Date: 17/11/2011 Start Qty: 1.00

1

Cust Item ID:

Required Date: 07/12/2011 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan:

Date:

Tooling:

Date:

Run Start *NR1*

QC:

Date:

SPC (Y/N):

Date:

Stop *NR2*

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

125

0.00

125

HandFXtube
Hand Finishing Crosstubes

Memo

Stress relief

Heat treat crosstube as per QSI010 4.3

Temp: _____

Start time: _____

Finish time: _____

0.00

see P10 to meter

P10: 16638

Per DEO D350-748-141 F-1

127

QC6- Inspect dimensions to drawing

0.00

127

QC
Quality Control

Memo

0.00

GP 12.04.11 ①

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Work Order ID 76574

76574

Page 3

November-17-11 1:03:21 PM

Item ID: D350-748-101 Accept ***N900040100*** Setup Start ***NS1***
 Revision ID: U/R Stop ***NS2***
 Item Name: Crosstube Installation, High Fwd
 Start Date: 17/11/2011 Start Qty: 1.00 ***1*** Cust Item ID:
 Required Date: 07/12/2011 Req'd Qty: 1.00 ***1*** Customer:
 Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____ Run Start ***NR1***
 QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
130	Crosstubes	0.00							
130									
Crosstubes	Memo	0.00							
Crosstubes	1-Drill Tube as per Dwg D350-748-141 Using DT8876 A,B & C Drill Jigs, Set-up drill table as per QSI 010								
	2-Deburr								
	3-Engrave Part # and Batch # as per Dwg D350-748-141								
	4-Remove all marks from tube within limits of D350-748-141								
	5-Apply a light coat of LPS3 on the interior of tube Batch: _____								
140	QC5- Inspect part completeness to step on W/O	0.00							
140									
QC	Memo	0.00							
Quality Control	CHECK 10 DEG HOLES WITH DT8876E (EUROCOPTER CLAMP)								

JW 12-04-20

MO 12-4-23

N/A

5/26/25



W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Work Order ID 76574

76574

Page 4

November-17-11 1:03:21 PM

Item ID: D350-748-101 Accept ***N900040100*** Setup Start ***NS1***
 Revision ID: U/R Stop ***NS2***
 Item Name: Crosstube Installation, High Fwd
 Start Date: 17/11/2011 Start Qty: 1.00 ***1*** Cust Item ID:
 Required Date: 07/12/2011 Req'd Qty: 1.00 ***1*** Customer:
 Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____ Run Start ***NR1***
 QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
150	Outsource process-Cadplate per QSI017 4.1.9.1	0.00							
150									
Outsource3	Memo	0.00							
Outsource process - Cad plate	Issue P/O: <u>16826</u> Stress relief at 375° for 5 hours Magnetic Particle Inspect per ASTM E1444 Cadium Plate per AMS-QQ-P-416B, Class 1, Type 2 Embrittle relief at 375° for 8 hours, Chromate Treat Possible Supplier: Southwest United Industries Ensure Certificate of Conformity is attached								CL 12/04/25 ①
160	Receive & Inspect for Damage & Mat'l Certs	0.00							
160									
Packaging	Memo	0.00							
Packaging	Ensure certificate of conformity is attached								
170	QC5- Inspect part completeness to step on W/O	0.00							
170									
QC	Memo	0.00							
Quality Control									

★ SEE W/O CHG ATTACHED
 NWL 12-05-22

6442/22 ①
 02/4/5 ②
 01/01/5 ③

Purch. issue P/O to Aamen P/O: 17031 CL 12/05/22
 we'd need inspect attached c/c to w/o P/O 12/05/22 ②

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

W/O: 16514		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector
11.10.05	161	LOAD TUBE TO 3500 ^{lb} FOR 1 MINUTE. REF D.S. EMAIL.		P 12.05.15	1	P 12.05.15 QSL/ML	
11.10.05	162	NDT TUBE.					

Part No: D350-748-101 PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Chris Provencal

From: David Shepherd <dshepherd@dartaero.com>
Sent: Tuesday, April 27, 2010 3:40 PM
To: 'Mike Petsche'
Cc: 'Bill Beckett'; 'L Lacelle'; 'Chris Provencal'; 'Dan Stow'; ssheldon@dartaero.com
Subject: 350 crosstubes

Mike,

I discussed the 350 crosstube load testing with Bill a little while ago and this plan makes sense to him.

So, my recommendation to clear these crosstubes is to load the fwd crosstubes to 3500 lb and the aft crosstubes to 3000 lb in the deflection test rig and document on the work orders that this test has been completed. Hold max load for 1 minute. Per TP-D350-748-2, these loads represent the maximum load on these crosstubes at gross weight and are below the yield point of the material. I would like to request that Chris Provencal witness these tests and sign off the work orders based on his experience with Dart landing gears. My feeling is that if there is a problem with the parts, it will manifest itself during this load test. I, for one, would feel a lot more confident in testing each crosstube in this manner than relying totally on what Exova has to say. I think it would be very difficult to reach a conclusion on the whole batch on the basis of cracks in two parts from the batch.

I believe that we can accomplish this before next Friday, which also gives us time to hear what Exova has to say in case it has an impact on our decision. So far, what I have seen from Exova shows me that there are fluctuations in the heat treating but the tubes are heat treated to our specification.

For this reason, I believe we should tell DHS that it looks like we will be able to start shipping 350 crosstubes by May 7th pending a successful Engineering test of the material.

David.

Work Order ID 76574

76574

Page 5

November-17-11 1:03:21 PM

Item ID: D350-748-101

Accept

N900040100

Setup Start ***NS1***

Revision ID: U/R

Stop ***NS2***

Item Name: Crosstube Installation, High Fwd

Start Date: 17/11/2011 Start Qty: 1.00

1

Cust Item ID:

Required Date: 07/12/2011 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____
QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start ***NR1***

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
180	SprayPaint	0.00							
180									
SprayPaint	Memo	0.00							
Spray Painting	1-Prime inside crosstube as per QSI 005 4.2 2-Prime Outside of Tube as per Dart QSI 005 4.2								
	B120133 start 8:00 Finish 8:45 B121625 start 12:30 Finish 1:30								
190	QC14- Inspect Spray Paint	0.00							
190									
QC	Memo	0.00							
Quality Control	Then, Wrap in plastic bag to protect from scratches								
200	Crosstubes	0.00							
200									
Crosstubes	Memo	0.00							
Crosstubes	1-Install Ground wire Insert, then insert screw and washer 2-Install Abraison strips as per Dwg D350-748-141 & QSI 035. 3-Install supports Using Dt8876 as per Dwg D350-748-141, Torque to 60-80 IN-LBS								

AS 12-5-19

12 05 20

12-5-20

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Work Order ID 76574

76574

Page 6

November-17-11 1:03:21 PM

Item ID: D350-748-101 Accept ***N900040100*** Setup Start ***NS1***
 Revision ID: U/R Stop ***NS2***
 Item Name: Crosstube Installation, High Fwd
 Start Date: 17/11/2011 Start Qty: 1.00 ***1*** Cust Item ID:
 Required Date: 07/12/2011 Req'd Qty: 1.00 ***1*** Customer:
 Reference:

Approvals: Process Plan: Date: Tooling: Date: Run Start ***NR1***
 QC: Date: SPC (Y/N): Date: Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
210	QC5- Inspect part completeness to step on W/O	0.00							
210									
QC	Memo	0.00							
Quality Control									
220	Pick Kit	0.00							
220									
Packaging	Memo	0.00							
Packaging									
230	QC4- 100% Inspect kits for completeness	0.00							
230									
QC	Memo	0.00							
Quality Control									

5/21/23

12/05/23 JB

12/05/23

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Work Order ID 76574

76574

Page 7

November-17-11 1:03:21 PM

Item ID: D350-748-101 Accept ***N900040100*** Setup Start ***NS1***
 Revision ID: U/R Stop ***NS2***
 Item Name: Crosstube Installation, High Fwd
 Start Date: 17/11/2011 Start Qty: 1.00 ***1*** Cust Item ID:
 Required Date: 07/12/2011 Req'd Qty: 1.00 ***1*** Customer:
 Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____ Run Start ***NR1***
 QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
240		0.00							
240	Packaging								
Packaging	Memo	0.00							
Packaging	Identify and pack for shipping as per PPP D350-748-101								
	Location: _____								
	PPP Rev: <u> 0 </u>								
250		0.00							
250	QC21- Final Inspection - Work Order Release								
QC	Memo	0.00							
Quality Control									

1440/230

12/5/29

MF
12-05-23

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Picklist Print

November-17-11 1:03:25 PM

Page 1

Work Order ID: 76574

76574

Parent Item: D350-748-101

D350-748-101

Parent Item Name: Crosstube Installation, High Fwd

Start Date: 17/11/2011

Required Date: 07/12/2011

Start Qty: 1.00

Required Qty: 1.00

Comments:

IPP Rev:A New Issue 06-07-05 JLM
 IPP Rev:B Update qty of MS21042L5 06-09-12 KJ
 IPP Rev:C Rev B 07-11-15 DD
 IPP Rev D Combined manufacturing 08.04.02 EC verified by: DD
 IPP Rev:E 08-06-24 revD as per dwg DD verified by:EC IPP Rev:F
 10.08.04 added QSI010 4.3 DD verf:EC

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
---------------------------------	------------------------	---------------	-------------	---------------------	------------------	-----------------	--------------------	----------------	-------------	--------------	---------------	----------------	--------

D350-748-141TRN Manufactured No

110

Each

3.0000

1

1

D350-748-141TRN

Crosstube Turning Detail

B74714

**

SAD

12-04-03

Location

Loc Qty

Loc Code

LG

3

73574

1

73577

1

73580

1

ALS4-1032-225

Purchased

No

200

Each

1,983.000

1

1

AI S4-1032-225

Insert

**

12-05-22
for Andy

Location

Loc Qty

Loc Code

ST281

1983

108696

283

110768

62

118386

858

118966

780

AN960JD10

NAS1149D0363J Purchased

No

200

Each

0.0000

1

1

AN960JD10

Washer

121243

**

①

12-5-20

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Picklist Print

November-17-11 1:03:25 PM

Page 2

Work Order ID: 76574

76574

Parent Item: D350-748-101

D350-748-101

Parent Item Name: Crosstube Installation, High Fwd

Start Date: 17/11/2011

Required Date: 07/12/2011

Start Qty: 1.00

Required Qty: 1.00

D2856-400

Manufactured No

200 f

278.8445 1.181 1.243158

D2856-400

Abraison Strip

**

AB 12-5-20

1,243158

Location	Loc Qty	Loc Code
ST403	0.3149	
68076	0.3149	
ST409	278.5296	
63735	0.6696	
71164	61.86	
73491	216	

D3502-1

Manufactured No

200 Each

35.0000 2 2

D3502-1

Support

**

AB 12-5-20

2

Location	Loc Qty	Loc Code
ST063	35	
68951	1	
72129	14	
73419	20	

MS21920-20

Purchased No

200 Each 70.0000 2 2

MS21920-20

Clamp (per MIL-DTL-8783C)

**

AB 12-5-20

2

Location	Loc Qty	Loc Code
LG050	70	
116799	10	
118649	10	
119386	50	

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Picklist Print

November-17-11 1:03:25 PM

Page 3

Work Order ID: 76574

76574

Parent Item: D350-748-101

D350-748-101

Parent Item Name: Crosstube Installation, High Fwd

Start Date: 17/11/2011

Required Date: 07/12/2011

Start Qty: 1.00

Required Qty: 1.00

MS27039-1-10

Purchased

No

200

Each

207.0000

1

1

MS27039-1-10

Screw

120120

**

①

AB 12-5-20

Location

Loc Qty

Loc Code

ST201

207

303

118612

61

119307

96

119531

50

Purchased

No

220

Each

297.0000

8

8

AN4-41A

AN4-41A

Bolt

**

JB



Location

Loc Qty

Loc Code

ST360

297

115108

3

115705

7

116191

12

117619

50

117795

25

118451

50

118838

50

119328

100

Purchased

No

220

Each

5,062.000

16

16

AN4-6A

AN4-6A

Bolt

**

121631 JB

12/05/23



Location

Loc Qty

Loc Code

ST356

62

119127

62

ST516

5000

119017

5000

November-17-11 1:03:25 PM

Shop Packet Print

Page 3

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Picklist Print

November-17-11 1:03:25 PM

Page 4

Work Order ID: 76574

76574

Parent Item: D350-748-101

D350-748-101

Parent Item Name: Crosstube Installation, High Fwd

Start Date: 17/11/2011

Required Date: 07/12/2011

Start Qty: 1.00

Required Qty: 1.00

AN5-32A

Purchased

No

220

Each

191.0000

4

4

**

12/4/15 JB

AN5-32A

Bolt

Location

Loc Qty

Loc Code

ST339

191

118422

16

118628

50

118983

25

119328

100

AN960ID416

NAS1149D0463J

Purchased

No

220

Each

0.0000

32

32

**

12/7/08 JB

AN960.ID416

Washer

AN960ID516

NAS1149D0563J

Purchased

No

220

Each

0.0000

8

8

**

11/9/46 JB

AN960.ID516

Washer

D3500-1

Manufactured

No

220

Each

12.0000

4

4

**

76000 JB

D3500-1

Saddle

Location

Loc Qty

Loc Code

ST424

4

70695

4

ST427

8

73407

8

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Picklist Print

Page 5

November-17-11 1:03:25 PM

Work Order ID: 76574

76574

Parent Item: D350-748-101

D350-748-101

Parent Item Name: Crosstube Installation, High Fwd

Start Date: 17/11/2011

Required Date: 07/12/2011

Start Qty: 1.00

Required Qty: 1.00

D3501-1

Manufactured No

220 Each

428.0000

16

16

**

D3501-1

Bushing

Location

Loc Qty

Loc Code

ST063

428

67757

4

70682

100

73391

117

74866

207

70682

MS21042L4

Purchased

No

220

Each

11,520.00

24

24

**

MS21042L4

Nut

Location

Loc Qty

Loc Code

ST300

558

117441

51

117601

374

118451

133

ST516

5962

119017

5962

ST518

5000

119075

5000

121011

JB

12/05/23

November-17-11 1:03:25 PM

Shop Packet Print

Page 5

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Picklist Print

November-17-11 1:03:25 PM

Page 6

Work Order ID: 76574

76574

Parent Item: D350-748-101

D350-748-101

Parent Item Name: Crosstube Installation, High Fwd

Start Date: 17/11/2011

Required Date: 07/12/2011

Start Qty: 1.00

Required Qty: 1.00

MS210421.5

Purchased

No

220

Each

2,300.000

4

4

**

MS210421 5

Nut

JB 12/02/23

Location

Loc Qty

Loc Code

ST300

800

116105

5

116548

43

117611

52

118179

496

118910

204

ST518

1500

119109

1500

119109

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

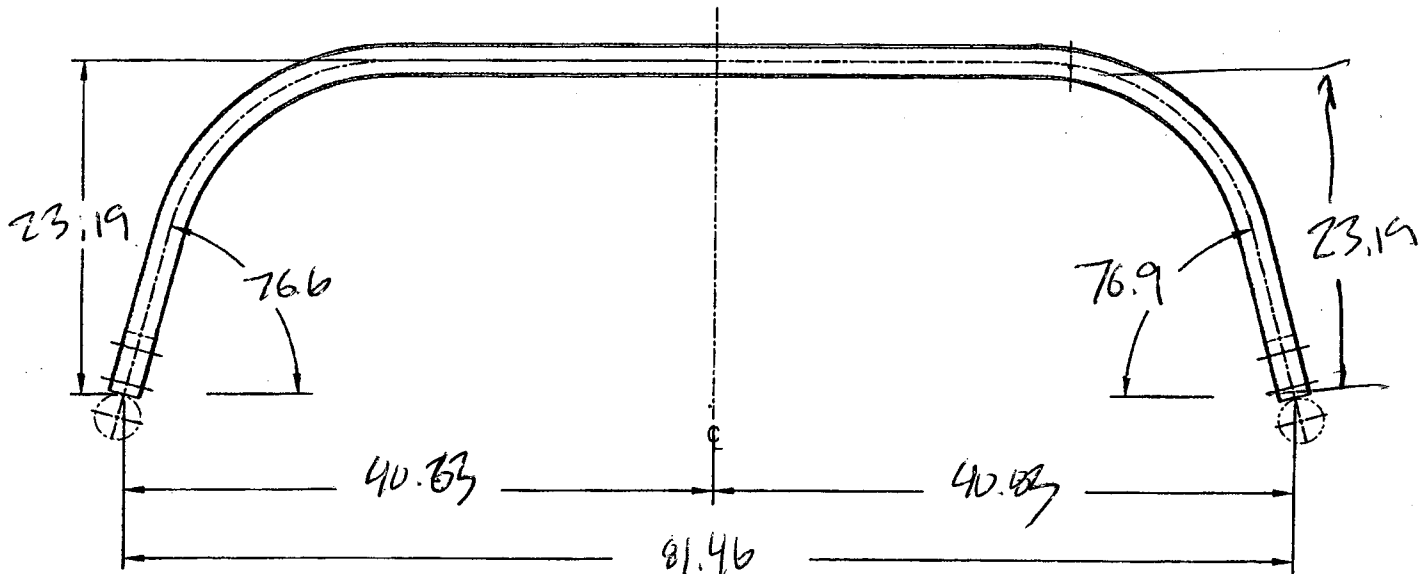
Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

DART AEROSPACE LTD		Work Order:	76574
Description: Crosstube High Fwd (AS350/355)		Part Number:	D350-748-101
Inspection Dwg: D350-748-141 Rev: F		Page 1 of 1	

Required Dimension	Min	Max
Height	23.13	23.37
1/2 Span	40.78	41.02
Angle	75	77
Total Span	81.56	82.04



Comments
Twist 0.144
CROSHING 4.9% / 4.6%
Acceptable P12.05.11 DS1042

QC15 Inspection	P12.04.11
Date	

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	10.08.23	Dwg Rev updated	KJ	
C	11.11.07	Dwg Rev updated	KJ	

2.087 2.098
2.297 2.299

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Item	Qty -141	Part Number	Description
1	X	D350-748-141	CROSSTUBE ASSEMBLY (AS 350/355 HI FWD)
2	1	D6015-125	CROSSTUBE (OR D6017-115)
3	2	D3502-1	SUPPORT
4	2	D2856-400-710	ABRASION STRIP
5	1	AELS-1032-225	INSERT
6	1	NAS1149D0363J	WASHER (OR AN960JD10)
7	2	MS21920-20	CLAMP (PER DART SPEC. M-MS21920-20)
8	1	MS27039-1-10	SCREW

GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6015-125 OR D6017-115
FINISHED LENGTH = 110.270±0.06
- 2) FINISH: MAGNETIC PARTICLE INSPECT PER DART QSI 038 4.2
CADMIUM PLATE PER AMS-QQ-P-416B, CLASS 1, TYPE II
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: DART PART NUMBER "D350-748-141" AND BATCH NUMBER ON INSIDE OF CUFF
PER DART QSI 044 6.4 (VIBRATING STYLUS)
- 7) WEIGHT: 30.45 lbs
- 8) PART IS SYMMETRIC ABOUT CENTERLINE, EXCEPT FOR Ø0.297 HOLE.
- 9) BLEND OUT ALL EDGES FROM MACHINING LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
NOTE: ALL HOLES ARE DRILLED AFTER BENDING.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 7 PASSES. MAXIMUM TUBE FLATTENING DUE TO
BENDING IS 6% BASED ON O.D.
- 11) HEAT TREAT TO MIN. 180 KSI PER MIL-T-6736 OR AMS 2759-1C AFTER TURNING. ACCEPTABLE TO
VERIFY TENSILE STRENGTH BY HARDNESS TEST PER ASTM E18 TO 40-45 HRC.
- 12) INSTALL D2856-400-710 ABRASION STRIPS WITH A GAP ON BOTTOM SIDE OF CROSSTUBE,
CENTERED OPPOSITE D3502-1 SUPPORT, PER QSI 035.
- 13) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE
OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES,
NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY.
CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE. WHEN DRILLING HOLES EXTREME CARE
MUST BE TAKEN AND CAREFUL DEBURRING PERFORMED TO ENSURE A CLEAN HOLE WITH NO
CRACKING/CHIPPING/GROOVES.
- 14) TORQUE CLAMPS 60 TO 80 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT
NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.
- 15) MAX TWIST AFTER BENDING: WITH XTUBE LAYED FLAT ON SURFACE, THE DIFFERENCE BETWEEN
CUFF HEIGHTS FROM THE SURFACE MAY BE NO LARGER THAN 0.25 (ZN C1-3).

SHOP COPY
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO. 76574 M.C.5
11/11/17

UNDER REVIEW

RELEASED
2011-01-18 D

F	ADD HRC TEST OPTION (B8-1) PER PAR 09-040, ADD TWIST LIMIT (A8-1, C1-3), ADD D6015-125 OPTION (C8-1), STOCK DIM NOW MACHINED (D1-4)	CP	10.11.23
E	REVISE GENERAL NOTES; UPDATE TO CURRENT ADD STANDARDS; RELOCATED FLAG #6 PER PAR 08-046 (ZN A6-3); TOLERANCES (ZN C6-3, D1-3)	RF	09.09.30
D	MAG. PARTICLE AND CAD PLATE AS MFD.	CP	06.10.31
C	ADD CAD PLATING	CP	06.08.14
B	ADD D6017-115 & PRIME AND PAINT	CP	06.06.30
A	NEW ISSUE	CP	06.03.31
REV.	DESCRIPTION	BY	DATE
DESIGN			
DRAWN			
CHECKED			
MFG. APPR.			
APPROVED			
DE APPR.			
DATE	10.11.23		

DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWING NO. D350-748-141	REV. F SHEET 1 OF 4
TITLE CROSSTUBE (AS 350/355 HI FWD)	SCALE NTS
COPYRIGHT © 2006 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

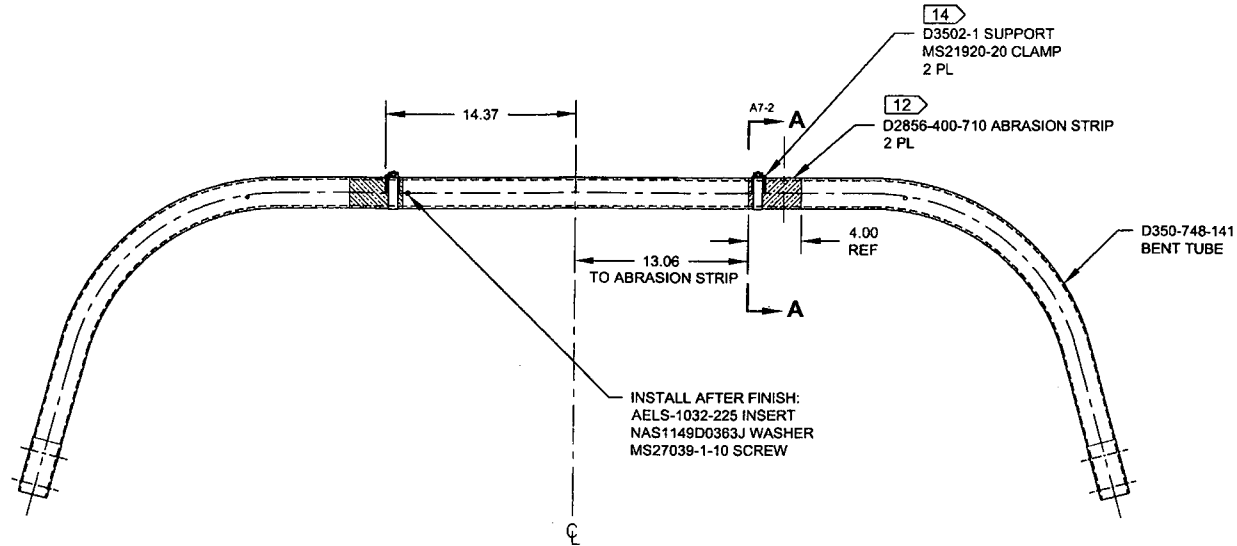
Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

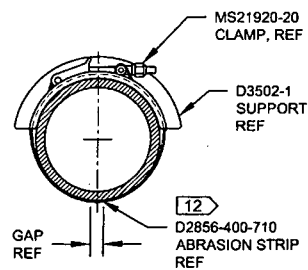
NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

76574



**D350-748-141
ASSEMBLY DETAIL**









SECTION A-A D4-2
SCALE 4X

UNDER REVIEW

11.07.11

RELEASED
2011-01-18

DESIGN		DART AEROSPACE LTD	
DRAWN		HAWKESBURY, ONTARIO, CANADA	
CHECKED		DRAWING NO.	REV. F
MFG. APPR.		D350-748-141	SHEET 2 OF 4
APPROVED		TITLE	SCALE
DE APPR.		CROSSTUBE (AS 350/355 HI FWD)	NTS
DATE	10.11.23	COPYRIGHT © 2006 BY DART AEROSPACE LTD	
THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.			

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

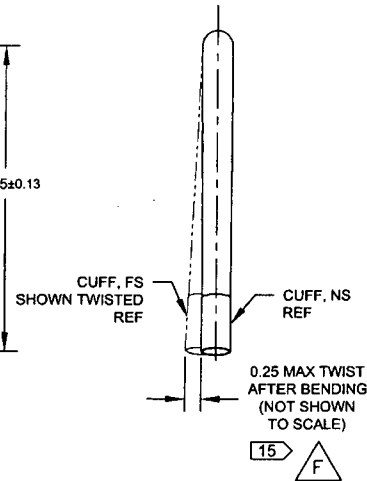
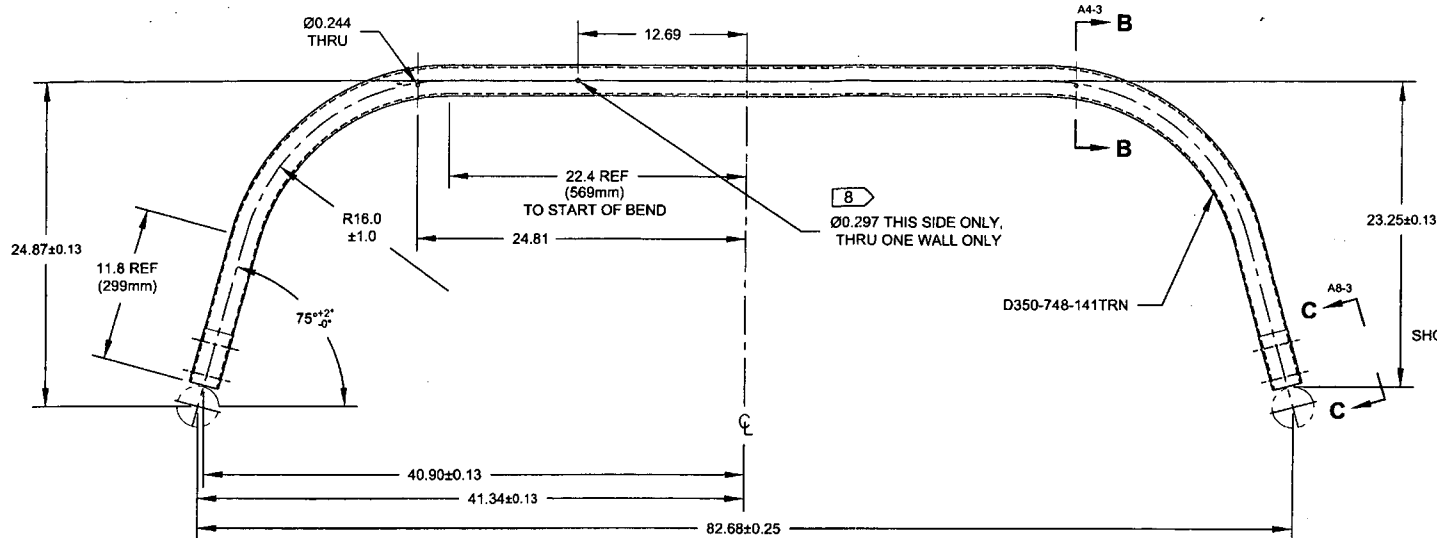
Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

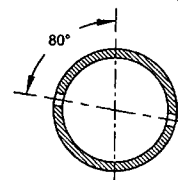
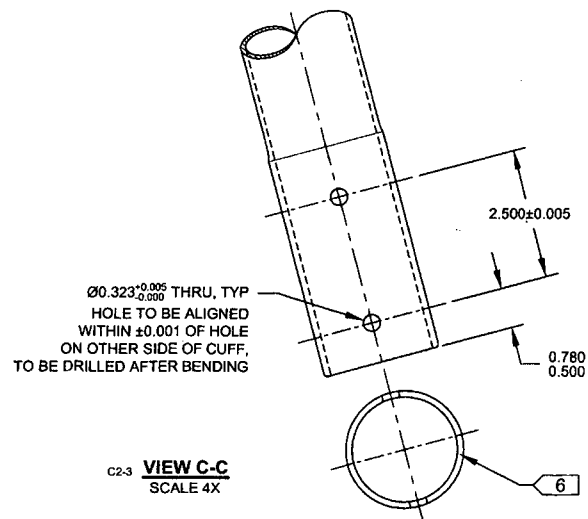
NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

76574



D350-748-141
BENDING AND DRILLING DETAIL 10



SECTION B-B D3-3
SCALE 4X

UNDER REVIEW
11.27.12

RELEASED
2011-01-18

DESIGN	9P	DART AEROSPACE LTD	
DRAWN	9P	HAWKESBURY, ONTARIO, CANADA	
CHECKED	h	DRAWING NO.	REV. F
MFG. APPR.	h	D350-748-141	SHEET 3 OF 4
APPROVED	h	TITLE	SCALE
DE APPR.	h	CROSSTUBE (AS 350/355 HI FWD)	NTS
DATE	10.11.23	<small>COPYRIGHT © 2006 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.</small>	

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

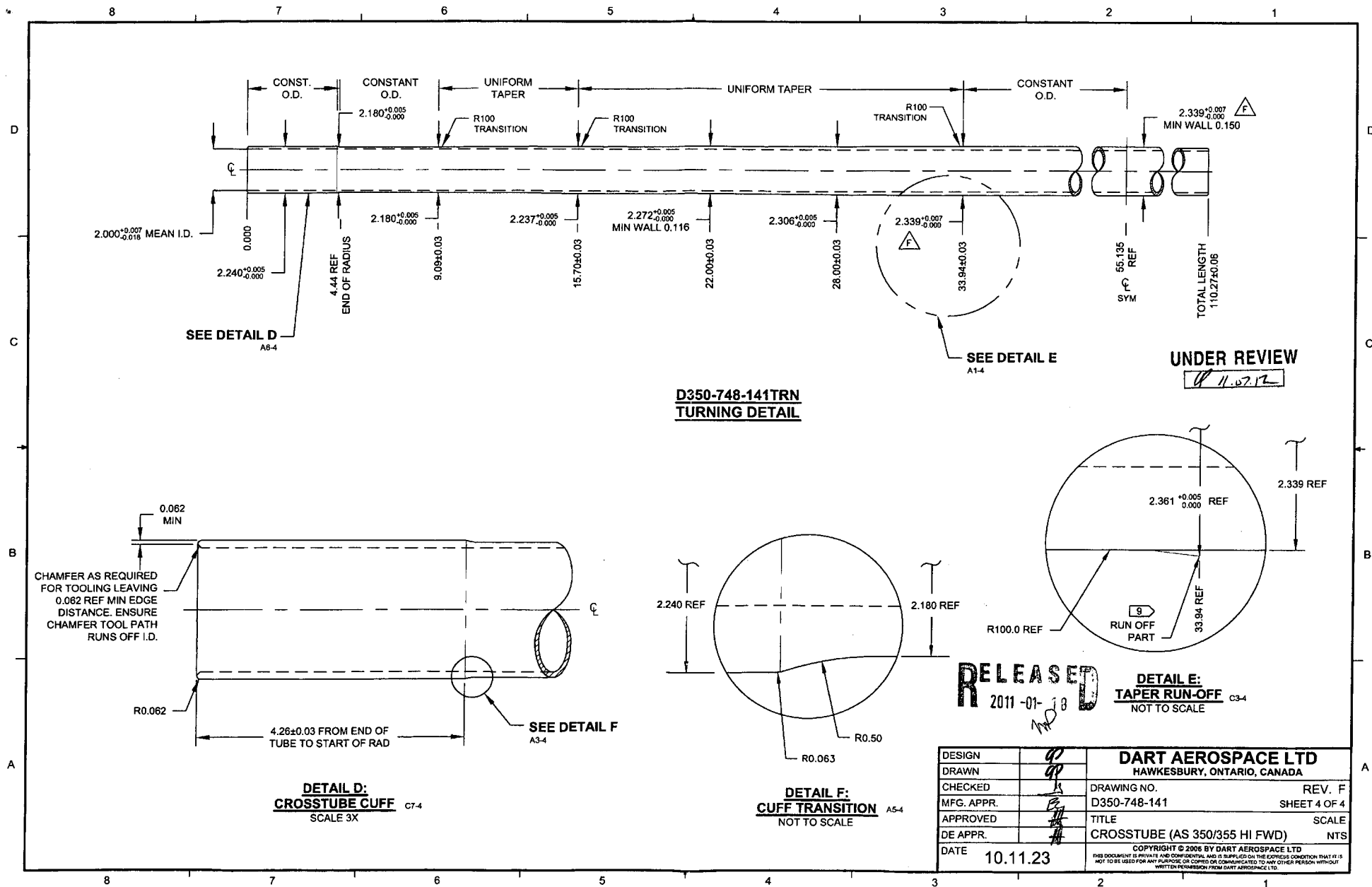
Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

76574



W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

DRAWING NO. D350-748-141	TITLE CROSSTUBE (AS 350/355 HI FWD)	REV. F	DART AEROSPACE LTD ENGINEERING ORDER		D.E.O. NO. D350-748-141-F-1	SHEET NO. SHEET 1 OF 1	SCALE NTS
DRAWN <i>UP</i>	CHECKED <i>1</i>	MFG. APPR. <i>11</i>	APPROVED <i>WD</i>		DE APPR. <i>TH</i>		
DATE 12.04.02	DATE 12.04.03	DATE 12.04.03	DATE 12.04.03		DATE 12.04.03		

PURPOSE:

ADD A STRESS RELIEF OPERATION FOLLOWING BENDING

CHANGE:

ADD

10) AFTER BENDING: STRESS RELIEF AT 650°F ± 25°F FOR A MINIMUM OF 2 HRS.
AIR COOL TO AMBIENT TEMPERATURE
(REF. AMS2759/1E)

COPYRIGHT © 2012 BY DART AEROSPACE LTD

THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.

METCOR INC.

560 BOUL. ARTHUR-SAUVÉ
ST-EUSTACHE, QC, J7R 5A8

Tel: 450-473-1884 / Fax: 450-491-5498

Certificat de Conformité Détaillé

Detailed Certificate of Compliance

BON DE TRAVAIL order	CHARGEMENT load
175005	1

CLIENT / customer 215

DART AEROSPACE
1270 ABERDEEN
HAWKESBURY

ON K6A 1K7

LIVRÉ À / shipped to:

DART AEROSPACE
1270 ABERDEEN
HAWKESBURY

ON K6A 1K7

COMMANDE DU CLIENT customer po	BON DE LIVRAISON DU CLIENT customer shipper no.	MATÉRIEL material	CODE DE TRAITEMENT mat'l heat code	NUMÉRO DE LOT lot number
PO16638		Steel		

SPÉCIFICATIONS DU PROCÉDÉ

processing specifications

STRESS REL

SAE AMS 2759/1 REV.E

EXIGENCE / requirement SPÉCIFICATIONS / specified TESTS EXÉCUTÉS / performed RÉSULTATS DE TESTS / results
Visual

QUANTITÉ quantity	POIDS weight	DESCRIPTION DES PIÈCES parts description
9	270	D350-748-101 (7) CROSS TUBE (2) D350-748-201 CROSS TUBE CONTENANT: 1 NIL

Operation	Temp. spécifiée Specified Temp	Temps de trempage Spécifié Specified Soak Temp	Atmosphère	Carbone Carbon Potential	Q-Media Q-Temp	Four # Furnace #	Date Départ Start Date	Heure d'entrée Time In	Heure de sortie Time Out	Date Complétée Date complete
1,00 CONT. INIT.	LAVAGE		si nécessaire							
2,00 PREPARINC	COMPTAGE									
3,00 STRESS RE	650 +/-25°F	2 hrs	air			701				
4,00 FINAL INSP							04-05-2012			04-05-2012

COMMENTAIRES / comments

ALL THE HEAT TREATMENT PROCESSING PERFORMED ON THIS ORDER WAS ACCOMPLISHED USING HEAT TREATMENT EQUIPEMENT THAT MEETS THE REQUIREMENTS OF AMS 2759. ALL THE HEAT TREATMENT OPERATIONS WERE ACCOMPLISHED IN ACCORDANCE WITH THE REQUESTED/REQUIRED HEAT TREATMENT SPECIFICATION AND ALL REQUIRED VERIFICATIONS TEST HAVE BEEN PERFORMED AND DOCUMENTED. NO UNAUTHORIZED CHANGES OR DEVIATIONS TO REQUIRED HEAT TREATMENT SPECIFICATIONS OR PROCEDURES HAVE BEEN PERFORMED.

METCOR INC.

560 BOUL. ARTHUR-SAUVÉ

ST-EUSTACHE, QC, J7R 5A8

Tel: 450-473-1884 / Fax: 450-491-5498

Certificat de Conformité Détaillé

Detailed Certificate of Compliance

BON DE TRAVAIL order	CHARGEMENT load
175005	1

CLIENT / customer 215

DART AEROSPACE

1270 ABERDEEN

HAWKESBURY

ON K6A 1K7

LIVRÉ À / shipped to:

DART AEROSPACE

1270 ABERDEEN

HAWKESBURY

ON K6A 1K7

1

APPROUVÉ par / Approved by:

Stu Salame

MET
16

DATE: 2012-04-05

/ Nous certifions que toute l'information comprise sur ce rapport est exacte et conforme aux requis du client./We certify that all the information on this report is exact and in accordance with the order requirements.



Metcor Inc.
560, boul. Arthur-Sauvé
St-Eustache (Québec) J7B 5A8
Tel: 450-491-5498
Télécopieur/Fax: 450-491-6454

Certificat de conformité
Certificate of conformance

BON DE TRAVAIL	CHARGEMENT
order	load
175005	1

CLIENT / customer 216
DART AEROSPACE
1270 ABERDEEN
HAWKESSBURY

ON K6A 1K7

LIVRÉ À / shipped to:
DART AEROSPACE
1270 ABERDEEN
HAWKESSBURY

ON K6A 1K7

COMMANDE DU CLIENT	BON DE LIVRAISON DU CLIENT	MATÉRIEL	CODE DE TRAITEMENT	NUMÉRO DE LOT
customer po	customer shipper no.	material	mat'l nest code	lot number
		Steel		

SPÉCIFICATIONS DU PROCÉDÉ

processing specifications

STRESS REL

SAE AMS 2759/1 REV E

EXIGENCE / requirement SPÉCIFICATIONS / specified TESTS EXÉCUTÉS / performed RÉSULTATS DE TESTS / results
Visual

QUANTITÉ	POIDS	DESCRIPTION DES PIÈCES
qtty	weight	parts description
2	270	D350-748-141-F-1

COMMENTAIRES / comments

INSPECTEUR / inspector:

Smad

DATE: 2012-04-05


Dora Cameron

From: Dan Stow <dstow@dartaero.com>
Sent: April 18, 2012 4:42 PM
To: Dora Cameron
Subject: FW: 350 crosstubes oval cuffs



Dan Stow
Special Projects Manager
T. 613-632-5200 | C. 613-676-3320 | F. 613-632-1426
1270 Aberdeen Street, Hawkesbury, Ontario, Canada, K6A 2K7

The information contained in this transmission is privileged and confidential and intended only for the use of the individual or entity to whom it is addressed. If you are not the intended recipient, you are hereby notified that any distribution, copying, disclosure or taking of any action in reliance on the contents of this transmission is strictly prohibited and review by any individual other than the intended recipient shall not constitute waiver of privilege. If you have received this transmission in error, please notify us immediately and delete the original transmission.

 Please consider your environmental responsibility before printing this e-mail.

From: David Shepherd [mailto:dshepherd@dartaero.com]
Sent: Wednesday, April 18, 2012 12:10 PM
To: 'Bill Beckett'
Cc: 'Dan Stow'; 'L Lacelle'; 'Mike Petsche'; 'Eric Downing'; 'Pat Smith'
Subject: RE: 350 crosstubes oval cuffs

Agreed ... This seems OK to me ... Hopefully we only need to do this to a handful of crosstubes.

David

From: Bill Beckett [mailto:bbeckett@dartaero.com]
Sent: April-18-12 6:31 AM
To: 'David Shepherd'
Cc: 'Dan Stow'; 'L Lacelle'; 'Mike Petsche'; 'Eric Downing'; Pat Smith
Subject: RE: 350 crosstubes oval cuffs

David,

This looks like a relatively controllable process that we could have Dan carry out on the other crosstubes that are oval in the cuff area.

If you agree with this rework method, we will proceed with the remainder of the crosstubes. I suggest we do this via markup on the specific work orders.

Bill

From: Dan Stow [mailto:dstow@dartaero.com]
Sent: April 18, 2012 7:52 AM
To: Bill Beckett; David Shepherd; 'Mike Petsche'; L Lacelle; Eric Downing
Subject: 350 crosstubes oval cuffs

Hello All,

Dora Cameron

From: Dan Stow <dstow@dartaero.com>
Sent: April 18, 2012 4:42 PM
To: Dora Cameron
Subject: FW: 350 crosstubes oval cuffs



Dan Stow

Special Projects Manager

T. 613-632-5200 | C. 613-676-3320 | F. 613-632-1426

1270 Aberdeen Street, Hawkesbury, Ontario, Canada, K6A 2K7

The information contained in this transmission is privileged and confidential and intended only for the use of the individual or entity to whom it is addressed. If you are not the intended recipient, you are hereby notified that any distribution, copying, disclosure or taking of any action in reliance on the contents of this transmission is strictly prohibited and review by any individual other than the intended recipient shall not constitute waiver of privilege. If you have received this transmission in error, please notify us immediately and delete the original transmission.



Please consider your environmental responsibility before printing this e-mail.

From: David Shepherd [mailto:dshepherd@dartaero.com]
Sent: Wednesday, April 18, 2012 12:10 PM
To: 'Bill Beckett'
Cc: 'Dan Stow'; 'L Lacelle'; 'Mike Petsche'; 'Eric Downing'; 'Pat Smith'
Subject: RE: 350 crosstubes oval cuffs

Agreed ... This seems OK to me ... Hopefully we only need to do this to a handful of crosstubes.

David

From: Bill Beckett [mailto:bbeckett@dartaero.com]
Sent: April-18-12 6:31 AM
To: 'David Shepherd'
Cc: 'Dan Stow'; 'L Lacelle'; 'Mike Petsche'; 'Eric Downing'; Pat Smith
Subject: RE: 350 crosstubes oval cuffs

David,

This looks like a relatively controllable process that we could have Dan carry out on the other crosstubes that are oval in the cuff area.

If you agree with this rework method, we will proceed with the remainder of the crosstubes. I suggest we do this via markup on the specific work orders.

Bill

From: Dan Stow [mailto:dstow@dartaero.com]
Sent: April 18, 2012 7:52 AM
To: Bill Beckett; David Shepherd; 'Mike Petsche'; L Lacelle; Eric Downing
Subject: 350 crosstubes oval cuffs

Hello All,

**CERTIFICATE OF
CONFORMANCE**

**CADORATH PLATING CO. LTD.
2150 LOGAN AVENUE
WINNIPEG, MANITOBA R2J-0J1**

DATE: May-08-2012

CONSIGNEE TO: Dart Aerospace Ltd.
1270 Aberdeen St.
Hawksbury, ON K6A 1K7

W/O #: 114041
INVOICE #: 60317

**CONTRACT OR
PURCHASE ORDER #** PO16826

DESCRIPTION: SKID

QTY 1

P/N # d350-748-101

S/N # 76574

CADMIUM PLATE IAW AMS-QQ-P-416C TYPE 2 YELLOW CLASS 2.
MPI IAW ASTM-E-1444. BAKE HEAT CHART # 12-425 AND # 12-447.

CERTIFICATE: I certify that the items indicated here on have
been inspected and tested and conform to all specifications
and requirements detailed on the contract or purchase order.

Approved Inspector:





ACUREN

RAPPORT D'INSPECTION PAR RESSUAGE

P - 11201

PAGE

DE

HEURE

AM ☐PM ☒

CLIENT

ATTENTION

RESSUSCÉ

PROJET

EM(S) EXAMINÉ

DATE

N° TRAVAIL
ACUREN

N° CLIENT PO/WO

SITE DE TRAVAIL

ACCEPTATION STD.

DATE/RÉV.

DESCRIPTION DES TRAVAUX

N° PROCÉDURE

LT-002

DATE/RÉV.

2009

N° TECHNIQUE

LT-002

DATE/RÉV.

2009

N° ITEMS

DESCRIPTION

MATÉRIEL

ÉPAISSEUR

DÉTAILS DES INSPECTIONS

MÉTHODE :

MARQUE : Magnaflux

PÉNÉTRANT : 2500 2167

DISSOLVANT PÉNÉTRANT : H2O

RÉVÉLATEUR : SMD 5-2

TYPE RÉVÉLATEUR : ☒ NON AQUEUX ☐ AQUEUX ☐ SEC

SURFACE INSPECTÉE

CONDITION SURFACE : ☐ MEULÉE ☐ SOUDÉE ☒ MACHINÉE ☐ GRENAILLÉE ☒ MÉTAL PROPRETEMPÉRATURE SURFACE : ☐ < - 4°C / 20°F ☐ - 4°C / 20°F DE 10°C / 50°F ☐ 10°C / 50°F DE 52°C / 125°F ☐ > 52°C / 125°FRÉSULTATS- (☐ MÉTRIQUE ☐ IMPÉRIAL)See other sheet
for result

P/O 17031

Étendue des Services

L'entente selon laquelle le Groupe Acuren Inc. exécute les services ne concerne que les énoncés par écrit. En aucune circonstance ces services ne s'étendent au-delà de l'exécution des services demandés. Il est entendu que toutes les descriptions, les observations et les expressions d'opinions faites par Acuren reflètent les opinions ou les observations de l'entreprise fondées sur l'information et les hypothèses fournies par le propriétaire/opérateur, et elles ne constituent pas des déclarations ou des garanties ou ne peuvent être interprétées comme constituant. Le Groupe Acuren Inc. n'assume aucune des responsabilités du propriétaire/opérateur, et le propriétaire/opérateur conserve la responsabilité entière des décisions prises en matière d'ingénierie, de fabrication, de réparation et d'usage à partir de l'information ou des données fournies par Acuren en rapport avec les services décrits dans les présentes ne peuvent excéder le coût des services rendus.

Norme de Diligence

Dans l'exécution des services, le Groupe Acuren Inc. applique le degré de diligence, le soin et la compétence normalement exercés dans des circonstances semblables par d'autres fournisseurs de ce type de services opérant dans la même localité ou dans une localité similaire. Aucune autre garantie, implicite ou explicite, n'est faite ou voulue par le Groupe Acuren Inc.

SIGNATURES

REPRÉSENTANT

TECHNICIEN (SIGNATURE)

NOM (MOULÉ)

SIGNATURE

2^{ÈME} TECHNICIEN

ONGC NIVEAU 2 SNT NIVEAU 2

ONGC N° REG. 12205

ONGC NIVEAU

ONGC N° REG.

FTJ #

RAPPORT

RÉVISÉ PAR:

NOM

INITIALES

BLANCHE - COPIE DU CLIENT

JAUNE - COPIE DU BUREAU

ROSE - COPIE DU TECHNICIEN

OR - COPIE DU BUREAU

PT Décembre 200

CLIENT Dart Aerospace DATE May 17, 2012 HEURE ☐ AM ☒ PM
 ATTENTION NO. TRAVAIL ACUREN 188-12-2012

RÉSULTATS (☐ METRIQUE ☐ IMPÉRIAL)

			Cross tubes		Inspection	
Work order	ID	Item ID				
1	83060	D350-748-101				OK
2	77766	"	"	"	"	OK
3	76574	"	"	"	"	OK
4	81518	"	"	"	"	OK
5	76573	"	"	"	"	OK
6	77763	"	"	"	"	OK
7	73807	"	"	"	"	201 OK
8	81523	"	"	"	"	201 OK

on cross tube B 83060

No paper work
Fit with this
number
Inspection OK

2 x-tubes under
batch # 83060
→ Preliminary Design

Étendue des Services

L'entente selon laquelle le Groupe Acuren Inc. exécute les services décrits, les observations et les expressions d'opinions faites par les déclarations ou des garanties ou ne peuvent être interprétées comme des décisions prises en matière d'ingénierie, de fabrication, de services rendus.

Norme de Diligence

Dans l'exécution des services, le Groupe Acuren Inc. applique le degré de diligence ou dans une localité similaire. Aucune autre garantie, implicite ou explicite.

SIGNATURES

REPRÉSENTANT
À LA CLIENTÈLE

TECHNICIEN (SIGNATURE)

NAME (MOULÉE):

NIVEAU CGSB

No. ENREG. CGSB

1^{er} TECHNICIEN

NIVEAU SNT

NIVEAU CGSB

No. ENREG. CGSB

2^e TECHNICIEN

NIVEAU SNT

FTJ #:

RAPPORT
REVISÉ PAR:

NOM

INITIALES

en dehors de l'exécution des services demandés. Il est entendu que toutes les on et les hypothèses fournies par le propriétaire/opérateur, et elles ne constituent à propriétaire/opérateur, et le propriétaire/opérateur conserve la responsabilité rapport avec les services décrits dans les présentes ne peuvent excéder le coût des

emblables par d'autres fournisseurs de ce type de services opérant dans la même

5.0 PARTS LIST

Qty -101	Qty -201	Part Number	Description
X		D350-748-101	CROSSTUBE INSTALLATION, AS 350/355 HIGH FWD
	X	D350-748-201	CROSSTUBE INSTALLATION, AS 350/355 HIGH AFT
1		D350-748-141	CROSSTUBE ASSEMBLY, AS 350/355 HIGH FWD
	1	D350-748-241	CROSSTUBE ASSEMBLY, AS 350/355 HIGH AFT
*2	*2	D3502-1	SUPPORT
*2	*2	D2856-400-710	ABRASION STRIP
*1	*1	AELS-1032-225	INSERT
*2	*2	MS21920-20	CLAMP
*1	*1	MS27039-1-10	SCREW
*1	*1	AN960JD10	WASHER
4	4	D3500-1	SADDLE
16	16	D3501-1	BUSHING
16	16	AN4-6A	BOLT
8	8	AN4-41A	BOLT
4	4	AN5-32A	BOLT
32	32	AN960JD416	WASHER
8	8	AN960JD516	WASHER
24	24	MS21042L4	NUT (OR MS21042-4)
4	4	MS21042L5	NUT (OR MS21042-5)

* REFERENCE ONLY. PARTS ARE INCLUDED IN D350-748-141/241 ASSEMBLIES ABOVE

• COPYRIGHT © 2006 BY DART AEROSPACE LTD. •

THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.

Revision: B

Date: 07.06.15